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मानक

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“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 830 (1985): Tennis Racket Frames [PCD 22: Sports Goods]



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Satyanarayan Gangaram Pitroda

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“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

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Indian Standard

SPECIFICATION FOR TENNIS RACKET FRAMES

(Third Revision)

1. **Scope** — Covers material, dimensional and constructional requirements for tennis racket frames.
2. **Grades** — The tennis racket frames shall be of the following two grades based on the requirements given against each:

Grade	Requirements
1	Minimum six-ply (excluding veneer) laminated frame, having at least three plies of ash or beech and with full ash or beech or mulberry overlay at shoulders.
2	Minimum six-ply (excluding veneer) laminated frame, having at least two plies of ash or beech and with at least half ash or beech or mulberry or maple or celtis overlay at shoulders.

3. **Materials** — The timber shall be straight-grained and seasoned to moisture content not less than 10 percent and not exceeding 14 percent. It shall be free from knots, cracks, splits, borer holes, insect attacks and any kind of decay and stains.

3.1 **Bends** — The bends of the two grades of tennis racket frames shall be laminated (see also 2) out of the following timbers:

Grade	Trade Name	Botanical Name
1	Ash	<i>Fraxinus</i> spp.
	Beech	<i>Fagus</i> spp.
	Birch	<i>Betula</i> Utilis.
	Hickory	<i>Carya</i> spp.
	Maple	<i>Acer</i> spp.
2	Walnut	<i>Juglans regia</i> Linn.
	Ash	<i>Fraxinus</i> spp.
	Beech	<i>Fagus</i> spp.
	Birch	<i>Betula</i> Utilis.
	Hickory	<i>Carya</i> spp.
	Hornbeam	<i>Carpinus</i> spp.
	Maple	<i>Acer</i> spp.
	Rosewood	<i>Dalbergia latifolia</i> Roxb.
	Toon	<i>Cedrela toona</i> Roxb.
	Walnut	<i>Juglans regia</i> Linn.

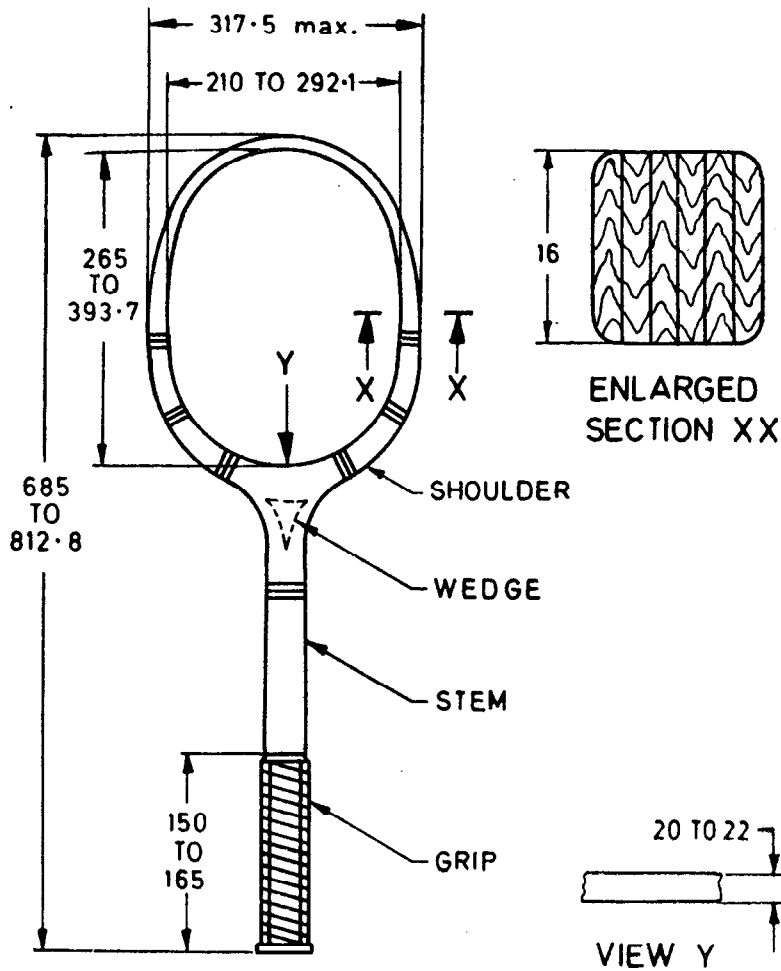
3.2 **Handle** — The handle shall be made out of any of the following timbers:

Trade Name	Botanical Name
Gutel	<i>Trewia nudiflora</i> Linn.
Horse chestnut	<i>Aesculus indica</i> Colebr.
Poplar	<i>Populus</i> spp.
Sycamore	<i>Acer pseudoplatanus</i>
Toon	<i>Cedrela toona</i> Roxb.
Willow	<i>Salix</i> spp.

3.3 Wedge — The wedge shall be made out of any of the following timbers:

Trade Name	Botanical Name
Ash	<i>Fraxinus</i> spp.
Beech	<i>Fagus</i> spp.
Dhaman	<i>Crewia tillifolia</i> Vahl.
Mulberry	<i>Morus</i> spp.
Poplar	<i>Populus</i> spp.
Rosewood	<i>Dalbergia latifolia</i> Roxb.
Silver oak	<i>Grevillea robusta</i> A. Cunn.
Sycamore	<i>Acer pseudoplatanus</i>
Toon	<i>Cedrela toona</i> Roxb.
Walnut	<i>Juglans regia</i> Linn.
Willow	<i>Salix</i> spp.

4. Dimensions — Shall conform to Fig. 1.



All dimensions in millimetres.

FIG. 1 TENNIS RACKET FRAME

4.1 The maximum and the minimum thickness of the bend after finish shall be 16 mm and 12 mm respectively.

4.2 The length of the strung surface shall be between 265 and 393.7 mm, and the width of the strung surface shall be between 210 and 292.1 mm.

4.3 The number of holes for stringing the gut shall be between 62 and 66. The diameter of the holes shall be 3 mm for two-gut string and 2.5 mm for one-gut string.

4.4 The thickness of the ply shall be between 0.8 and 3.2 mm.

4.5 The grip of the tennis racket frame shall be between 150 and 165 mm in length. The designations of the grips shall be based on their girth and shall be as follows:

<i>Girth of the Grip</i>	<i>Designation No.</i>
mm	
102	0
105	1
108	2
111	3
114	4
118	5
121	6
124	7
127	8

5. Mass — Tennis racket frames shall be classified as light, medium and heavy according to their mass as follows:

<i>Type</i>	<i>Mass of Frame Including Grip</i>
Light	Up to 355 g
Medium	Over 355 g and up to 385 g
Heavy	Over 385 g and up to 410 g

6. Construction — All the plies shall be properly glued with cold-setting synthetic resin adhesive [see IS : 851-1978 'Specification for synthetic resin adhesives for construction work (non-structural) in wood (*first revision*)'] and fitted securely one by one on the shaping clamps with the help of a tennis-gluing press to form proper bends. Width of the crescent on the wedge point shall be 20 to 22 mm (see Fig. 1). Shoulders shall be reinforced with 'U' shape overlay which shall be bent and not cut to shape. The overlay may be of silver oak, beech, mulberry, brimji, fibre or synthetic material. In the case of synthetic materials, it may be cast. The surfaces of the bends and the throat shall be thoroughly rounded or bevelled. The frame shall be ground smooth with sand-paper, polished with cellulose lacquer and trimmed attractively with different matching colour schemes. The handle shall be octagonal and covered with leather grips. All holes shall be countersunk from inside. Holes on the shoulder side, not less than one-third of the total number of holes, shall be countersunk from outside too. Edges of the holes shall be smoothly rounded off.

6.1 The hitting surface of the racket shall be flat and consist of a pattern of crossed strings connected to a frame and alternatively interlaced or bonded where they cross; and the stringing pattern shall be generally uniform and, in particular, not less dense in the centre than in any other area. The frame including the handle and the string shall be free from attached object and protrusions other than those utilized solely and specifically to limit or prevent wear and tear or vibration, or to distribute weight and which are reasonable in size and placement for such purposes. The frame including the handle and the strings shall be free from any device which makes it possible for a player to change the shape of the racket.

7. Test — The racket shall be placed on a table and the handle pressed so that it rests evenly. The bend of the racket shall be square with the table and the height of the bend at various corresponding points on either side of the racket shall be equal. The racket shall be reversed and the test repeated.

8. Marking — Unless otherwise required by the purchaser, the following information shall be clearly marked on the frame and handle of each racket:

- Manufacturer's or supplier's name, initials or registered trade-mark;
- Grade;
- Type, that is, light, medium or heavy; and
- Designation of the grip.

8.1 The tennis racket frames may also be marked with the ISI Certification Marking. Details available with the Indian Standards Institution.

9. **Sampling** — Sampling and acceptance criteria for tennis racket frames shall be as agreed to between the purchaser and the supplier. A recommended scheme for the same is given in Appendix A.

10. **Packing** — The tennis racket frames shall be packed in polyethylene or water-proof material.

APPENDIX A

(Clause 9)

RECOMMENDED SAMPLING SCHEME AND CRITERIA FOR CONFORMITY FOR TENNIS RACKET FRAMES

A-1. Lot

A-1.1 In any consignment, all the racket frames of one grade, manufactured by the same firm, shall be grouped together to constitute a lot.

A-1.1.1 Each lot shall be tested separately to ascertain its conformity to the requirements of this standard.

A-2. Selection of Samples

A-2.1 Sample for test shall be selected at random from each lot in accordance with col 1 and 2 of Table 1.

TABLE 1 SAMPLE SIZE AND CRITERIA FOR CONFORMITY

(Clauses A-2.1 and A-3.4.1)

Lot Size (Number of Frames in the Lot)	Sample Size (Number of Frames to be Selected)	Acceptance Number*
(1)	(2)	(3)
Up to 15	3	2
16 to 26	5	3
27 „ 40	7	5
41 „ 65	10	7
66 „ 110	15	10
111 „ 180	25	16
181 „ 300	35	22

*The number of defects observed in the test sample.

A-3. Number of Tests and Criteria for Conformity

A-3.1 Each frame in the test sample shall be first examined for materials as given in 3. If any frame in the test sample is noticed to have been made of materials other than those specified, all the frames in the lot shall be examined and those not conforming to this specification rejected.

A-3.2 If the frames are made of satisfactory materials, each frame in the test sample shall be tested for the constructional requirements as given in 6 and the test given in 7.

A-3.3 During testing any frame as in A-3.2, each instance of its lack of conformity to the specification shall be considered as a defect of the frame. While examining any test sample, the total number and types of such defects shall be noted down.

A-3.4 A lot shall be accepted as conforming to the specification if the corresponding test sample satisfies the conditions laid down in A-3.4.1 and A-3.4.2.

A-3.4.1 The total number of defects observed during testing as in A-3.3 shall not exceed the corresponding acceptance number given in col 3 of Table 1.

A-3.4.2 The total number of defects of any one type observed during testing as in A-3.3 shall be less than half the corresponding acceptance number.

EXPLANATORY NOTE

On the suggestion of Consultative Committees of Parliament for Department of Sports, the concerned Panel of Sports Goods Sectional Committee has brought in line this standard with the requirements covered in respective Sports Goods Federation's handbook.